U.S. Department of the Interior U.S. Geological Survey

METAL INDUSTRY INDICATORS

May 1997

Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

International Indicator Added to Metals Price Leading Index

It is common knowledge among people familiar with nonferrous metals that prices are set in a global market. The metals price leading index, however, has lacked an international indicator since last September, when we removed the 6-month smoothed growth rate of an eleven-country leading index. The 6-month smoothed growth rate is a compound annual rate that measures the near-term trend.

Growth in the eleven-country index, which is produced by the Center for International Business Cycle Research, led overall growth in nonferrous metal prices by about 3 months. But the lead was only before price growth peaks, with no lead before troughs. As a result, the eleven-country leading index was not very effective in signaling the direction of metal prices.

We recently examined the OECD total leading index, another international indicator, as a possible candidate for the metals price leading index. The OECD leading index has a 6-month lead over an industrial production index for the countries included in the OECD.[1] Its 6-month smoothed growth rate also proves to be a good indicator of future price growth for nonferrous metals at both peaks and troughs.

Leading Indicators (6 months ago and latest month)		Outlook
Leading Index of Metal Prices		The leading index indicates that most metal prices could grow at a slow-to-moderate pace for the rest of the year.
Sept '96	94.8	
Mar '97	97.1	
Primary Metals Leading Index		The leading index points to moderate growth in overall primary metals activity in the coming months.
Oct '96	120.3	
Apr '97	124.3	
Steel Leading Index		The domestic steel industry is likely to grow modestly in the near term.
Sept '96	102.5	
Mar '97	104.7	
Aluminum Mill Products Leading Index		Both aluminum leading indexes point to moderate near-term growth in the U.S. aluminum industries.
Sept '96	141.1	
Mar '97	143.3	
Copper Leading Index		Slow growth seems likely for the domestic copper industry.
Sept '96	118.0	
Mar '97	122.8	

NOTE: Historical data back to 1948 for 12 of the indexes in Metal Industry Indicators (MII) are now on the World Wide Web. The URL for the MII is: http://minerals.er.usgs.gov/minerals/pubs/mii/

Since 1961, growth in the OECD leading index anticipates changes in growth in the MII nonferrous metals price index 88% of the time, with an average lead of 6 months. We have, therefore, added the OECD index to the metals price leading index.

To improve the performance of the price leading index further, we have dropped the indicator for total deflated debt in U.S. nonfinancial sectors. Over the last 10 years, growth in total debt has declined dramatically, with very little growth and cyclical behavior taking place since 1991. The new metals price leading index still includes indicators for the deflated values of new orders for U.S. nonferrous metals and M2 money supply, and an index of building permits for new U.S. private housing construction.

The result of these changes is that the movement of the metals price leading index improves significantly from 1990 forward (see Chart 1). However, the average lead of the new metals price leading index over the MII nonferrous metals price index, falls to 7 months, compared with 8 for the old leading index. *(continued on page 2)*

[1]The OECD stands for Organization for Economic Cooperation and Development and was established in 1960 to promote sustainable economic growth, world trade, and employment. It is composed of twenty-five nations from North America, Europe, and the Asia-Pacific region.

(continued from page 1)

Growth in the new metals price leading index began picking up in the fall of 1996. In March, the latest month for which data are available, the index stood at 97.1, almost unchanged from the 97.2 for February. Nonferrous metal prices also started climbing last fall, increased sharply in January and February, and then underwent a slowdown in growth in March and April, before they started increasing again in early May.

As for the inflation-adjusted value of inventories of U.S. nonferrous metal products, it fell in March, the latest month for which data are available, continuing a downward trend in inventory growth.

Separately, the OECD leading index has risen steadily since the beginning of 1996, but the most recent data show that actual economic growth, overall, for industrialized countries outside of the United States, has been modest. Moreover, any increase in growth that may now be occurring could be dampened if interest rates, which are on the rise, get too high. If the trend in the metals price leading index is reflecting a pickup in future economic growth, then most metal prices could grow at a slow-to-moderate pace for the rest of the year.

Historical data for the new metals price leading index are available on the World Wide Web.
(http://minerals.er.usgs.gov/minerals/pubs/mii/miihist.txt)

(continued on page 12)

Table 1.
Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices

		Six-Month Smoothed Growth Rates				
	Leading Index of Metal Prices (1967=100)	MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982$)	Primary Aluminum	Primary Copper	Steel Scrap
1996						
March	95.4r	-11.4	5.6	-9.6	-18.8	-3.3
April	95.5r	-9.2	4.8	-12.5	-9.9	-4.8
May	94.9r	-12.8	3.8	-14.1	-16.6	1.1
June	95.1r	-29.3	6.1	-21.6	-45.4	-2.2
July	95.5r	-24.1	10.6	-16.6	-39.9	-7.6
August	95.4r	-20.9	10.7	-15.6	-33.3	-5.8
September	94.8r	-26.8r	10.1	-23.5	-37.6	-1.3
October	94.7r	-21.1	8.2	-16.6	-31.7	-13.3
November	95.1r	2.1r	5.6r	-2.8	11.8	-26.3
December	95.6r	-6.9	3.0r	-2.0	-11.2	-21.8
1997						
January	96.5r	6.5	-1.3	9.8	6.6	-6.6
February	97.2r	11.0	-2.3r	12.7	10.5	3.7
March	97.1	10.4	-5.1	10.1	11.2	-3.3
April	NA	9.7	NA	10.8	12.2	-8.5

r *- Revised*

Note: The components of the Leading Index of Metal Prices are the 6-month smoothed growth rates of the following: 1, the deflated value of new orders for nonferrous metals; 2, the OECD leading index, total; 3, the index of new private housing units authorized; and 4, the deflated value of U.S. M2 money supply. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metals and nonferrous metal products. Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.

Sources: U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); the Bureau of the Census; and the Organization for Economic Cooperation and Development (OECD).

Link To:

Chart 1.

Table 2.
The Primary Metals Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
May	120.3	3.2	107.0	2.5
June	120.6	3.0	107.2	2.5
July	119.7	1.2	107.7	3.2
August	120.5	2.1	108.5	4.0
September	120.2	1.5	108.5	3.6
October	120.3	1.5	109.3	4.5
November	120.5r	1.5	108.7	2.9
December	121.9r	3.4r	109.2r	3.4r
1997				
January	121.9r	2.9r	109.2r	2.8r
February	123.1r	4.1r	109.8r	3.2r
March	124.0r	5.0r	110.1	3.3
April	124.3	4.9	NA	NA

r *- Revised*

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 3.
The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**March**	**April**
1. Average weekly hours, primary metals (SIC 33)	0.1r	0.4
2. S&P stock price index, machinery, diversified	0.1r	0.2
3. Ratio of price to unit labor cost (SIC 33)	0.3	NA
4. JOC metals price index growth rate	0.0	-0.2
5. New orders, primary metals, (SIC 33) 1982$	0.0	NA
6. Index of new private housing units authorized by permit	-0.1	NA
7. Growth rate of U.S. M2 money supply, 1992$	0.1	NA
8. Purchasing Managers' Index	0.2r	-0.2
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.7r	0.2

Coincident Index	**February**	**March**
1. Industrial production index, primary metals (SIC 33)	0.2r	0.3
2. Total employee hours, primary metals (SIC 33)	0.2	0.1
3. Value of shipments, primary metals, (SIC 33) 1982$	0.0	-0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.5r	0.3

Sources: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, Center for International Business Cycle Research, Bureau of Labor Statistics, and Federal Reserve Board; 4, Journal of Commerce; 5, Bureau of the Census and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

NA*: Not available* ***r*** *- Revised*

Note: A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

Links To:

Chart 2.

Chart 3.

Table 4.
The Steel Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
April	103.6	2.4	98.0	1.3
May	103.8	2.3	98.3	1.9
June	103.9	2.0	98.8	2.7
July	102.9	-0.2	99.0	2.7
August	102.5	-1.1	98.6	1.5
September	102.5	-1.1	98.6	1.2
October	101.9	-2.1	99.2	2.2
November	102.7	-0.6	98.5	0.6
December	103.4	0.6	98.9	1.2
1997				
January	103.8	1.3	99.5r	2.2r
February	104.4	2.3r	99.3r	1.4r
March	104.7	2.7	99.7	1.8

r *- Revised*

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 5.
The Contribution of Each Steel Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**February**	**March**
1. Average weekly hours, blast furnaces and basic steel products (SIC 331)	-0.1	0.1
2. New orders, steel works, blast furnaces, and rolling and finishing mills, 1982$, (SIC 331)	-0.1r	0.0
3. Shipments of household appliances, 1982$	0.3	0.0
4. S&P stock price index, steel companies	0.0	0.0
5. Industrial production index for automotive products	0.1r	0.1
6. Growth rate of the price of steel scrap (#1 heavy melting, $/ton)	0.2	-0.1
7. Index of new private housing units authorized by permit	0.1	-0.1
8. Growth rate of U.S. M2 money supply, 1992$	0.0r	0.1
9. Purchasing Managers' Index	0.1	0.2
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.6r	0.3
Coincident Index		
1. Industrial production index, basic steel and mill products (SIC 331)	0.1r	0.3
2. Value of shipments, steel works, blast furnaces, and rolling and finishing mills (SIC 331), 1982$	-0.2r	0.0
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	-0.2	0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-0.2r	0.5

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey; 4, Standard & Poor's; 5, Federal Reserve Board; 6, Journal of Commerce and U.S. Geological Survey; 7, Bureau of the Census and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

NA*: Not available* ***r*** *- Revised*

Links To:

Chart 4.

Chart 5.

Table 6.
The Aluminum Mill Products Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
April	138.5	3.6	122.6	0.3
May	139.4	4.1	123.6	1.9
June	139.7	3.7	121.8	-0.8
July	139.2	2.3	123.3	1.7
August	139.6	2.3	124.3	3.1
September	141.1	4.1	125.4	4.5
October	138.5	0.2	123.8	1.7
November	140.1	2.2	124.5	2.6
December	140.7	2.8r	124.7r	2.6r
1997				
January	141.7r	3.9r	123.2r	0.0r
February	143.8	5.9r	124.5r	1.4r
March	143.3	4.4	123.6	-0.2

r *- Revised*

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 7.
The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**February**	**March**
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)	0.4	0.2
2. Index of new private housing units authorized by permit	0.2	-0.1
3. Industrial production index for automotive products	0.1	0.1
4. Construction contracts, commercial and industrial (mil. sq. ft.)	0.3	-0.7
5. Net new orders for aluminum mill products (mil. lbs.)	0.2r	-0.4
6. Growth rate of U.S. M2 money supply, 1992$	-0.1	0.1
7. Purchasing Managers' Index	0.1	0.3
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	1.3r	-0.4
Coincident Index		
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)	1.0r	0.4
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)	0.2	0.1
3. Shipments of aluminum mill products (mil. lbs.)	-0.2r	-1.3
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	1.1r	-0.7

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Federal Reserve Board; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted.

NA: Not Available *r - Revised*

Links To:

Chart 6.

Chart 7.

Table 8.
The Copper Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
April	119.3	4.0	112.6	1.2
May	119.2	3.2	112.6	1.0
June	118.1	1.0	112.6	0.9
July	118.0	0.6	113.0	1.5
August	117.9	0.3	112.3	0.0
September	118.0	0.4	114.0	2.8
October	118.4	0.9	115.2	4.4
November	120.4	3.6r	113.4	1.0
December	119.8	2.3	114.6r	2.8r
1997				
January	119.7	2.0	113.5r	0.7r
February	121.5r	4.4r	114.2	1.6r
March	122.8	5.9	113.8	0.9

r *- Revised*

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 9.
The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**February**	**March**
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	0.0r	0.3
2. New orders, nonferrous and other primary metals, 1982$	0.0r	-0.1
3. MII stock price index, copper companies	0.1	0.2
4. Ratio of shipments to inventories, electronic and other electrical equipment (SIC 36)	1.1r	0.7
5. Growth rate of the LME spot price of primary copper	0.1	0.0
6. Index of new private housing units authorized by permit	0.2	-0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	1.5r	1.0
Coincident Index		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	0.2	-0.1
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	0.4r	0.1
3. Copper refiners' shipments (short tons)	0.0r	-0.3
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.7r	-0.2

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Bureau of the Census and U.S. Geological Survey; 5, London Metal Exchange and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3 and 5 of the leading index.

NA*: Not available* ***r*** *- Revised*

Links To:

Chart 8.

Chart 9.

(continued from page 2)

Outlook Good for U.S. Metal Industries

The latest 6-month smoothed growth rates of the metal industry leading indexes, a reflection of the near-term outlook, remain relatively high. As such, the domestic metals industry should continue to see more growth in the months ahead. Other factors, such as the prospect of improving foreign economies and a weaker U.S. dollar, may also boost domestic metals activity. Although U.S. interest rates have risen lately, the spread between the 10-year Treasury Bond yield and the Federal Funds rate is above 1% and has been rising slowly since November. When this yield spread is above 1% and rising, it's unlikely that metals activity will decline.

Production in U.S. metal industries, however, could be held down by limited capacity. Federal Reserve board figures for capacity utilization in the metal industries show that most of these industries are operating significantly above their averages, and in some cases, such as primary copper, they are currently operating above their historic highs.

The primary metals leading index for April moved up 0.2% to 124.3 from a revised 124.0 in March. Four of the index's eight components were available for April. Gains in the average workweek in primary metals establishments and the S&P stock price index for diversified machinery were large enough to offset declines in the Purchasing Managers' Index and the growth rate of the JOC metals price index. The leading index is pointing to moderate growth in the coming months for the overall primary metals industry, which is composed of 26 basic metal industries.

In March, the latest month for which data are available, the steel leading index increased 0.3% to 104.7 from 104.4 in February. None of the index's nine components made a strong move, with most components either unchanged or barely increasing. The 6-month smoothed growth rate of the steel leading index grew to 2.7%, equaling the highest rates achieved since the spring of 1994. Based on the trend in this growth rate, the domestic steel industry is likely to grow modestly in the near term.

The aluminum mill products leading index was the only metal industry leading index to decline in March, slipping 0.3% to 143.3 from 143.8 in February. The 6-month smoothed growth rate of the aluminum mill products leading index also decreased, from 5.9% in February to 4.4% in March. The growth rate, though, is still well above +1.0%, the rate that usually indicates a positive near-term trend in industry activity. Decreases in commercial and industrial construction contracts and net new orders for aluminum mill products were the largest factors in the leading index's net decline.

The other aluminum leading index, the index for primary and secondary aluminum, increased 0.8% in March, moving to 237.3 from a revised 235.4 in February. The largest contributions to the net increase in this index came from the industrial production index for aluminum mill products, the Standard & Poor's stock price index for aluminum companies, and the price of primary aluminum on the London Metal Exchange. Both aluminum leading indexes are pointing to continued moderate growth in the U.S. aluminum industries in the near future. (Tables and charts for the primary and secondary aluminum indexes are in a separate file.)

The copper leading index increased 1.1% in March, marking the first time since 1992 that this index has posted consecutive monthly increases of more than 1.0%. Moreover, the percentage increase between January and March was the largest since 1987. However, the leading index increase during this period was largely the result of one component. The ratio of shipments to inventories for electronic and other electrical equipment accounted for two-thirds of the net increases in February and March. Most of the other index components have also been rising since the beginning of the year, but at a much slower pace. Continued modest growth seems likely for the domestic copper industry.

The leading index for primary metals signals major changes in industry activity an average of 9 months in advance. The average leads for the steel and copper leading indexes are 8 and 7 months, respectively. Both the primary and secondary aluminum and aluminum mill products leading indexes signal changes in aluminum activity an average of 6 months in advance.

The next Metal Industry Indicators summary is scheduled for release on MINES FaxBack at 10:00 a.m. EDT, Friday, June 20. Access MINES FaxBack from a touch-tone telephone attached to a fax machine by dialing 703-648-4999.

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